X-linked spondyloepiphyseal dysplasia tarda

X-linked spondyloepiphyseal dysplasia tarda is a condition that impairs bone growth and occurs almost exclusively in males. The name of the condition indicates that it affects the bones of the spine (spondylo-) and the ends (epiphyses) of long bones in the arms and legs. "Tarda" indicates that signs and symptoms of this condition are not present at birth, but appear later in childhood, typically between ages 6 and 10.

Males with X-linked spondyloepiphyseal dysplasia tarda have skeletal abnormalities and short stature. Affected boys grow steadily until late childhood, when their growth slows. Male adult height ranges from 4 feet 10 inches to 5 feet 6 inches. Individuals with X-linked spondyloepiphyseal dysplasia tarda have a short trunk and neck, and their arms appear disproportionately long. Impaired growth of the spinal bones (vertebrae) causes the short stature seen in this disorder. The spinal abnormalities include flattened vertebrae (platyspondyly) with hump-shaped bulges, progressive thinning of the discs between vertebrae, and an abnormal curvature of the spine (scoliosis or kyphosis). Other skeletal features of X-linked spondyloepiphyseal dysplasia tarda include an abnormality of the hip joint that causes the upper leg bones to turn inward (coxa vara); a broad, barrel-shaped chest; and decreased mobility of the elbow and hip joints. Arthritis often develops in early adulthood, typically affecting the hip joints and spine.

Frequency

The prevalence of X-linked spondyloepiphyseal dysplasia tarda is estimated to be 1 in 150,000 to 200,000 people worldwide.

Genetic Changes

Mutations in the *TRAPPC2* gene (often called the *SEDL* gene) cause X-linked spondyloepiphyseal dysplasia tarda. The *TRAPPC2* gene provides instructions for producing the protein sedlin. The function of sedlin is unclear. Researchers believe that sedlin is part of a large molecule called the trafficking protein particle (TRAPP) complex, which plays a role in the transport of proteins between various cell compartments (organelles). Because sedlin is active (expressed) in cells throughout the body; it is unclear why mutations in the *TRAPPC2* gene affect only bone growth.

Inheritance Pattern

X-linked spondyloepiphyseal dysplasia tarda is inherited in an X-linked recessive pattern. The *TRAPPC2* gene is located on the X chromosome, which is one of the two sex chromosomes. In males (who have only one X chromosome), one altered copy of the gene in each cell is sufficient to cause the condition. In females (who have two X

chromosomes), a mutation must be present in both copies of the gene to cause the disorder. Males are affected by X-linked recessive disorders much more frequently than females. A characteristic of X-linked inheritance is that fathers cannot pass X-linked traits to their sons.

In X-linked recessive inheritance, a female with one mutated copy of the gene in each cell is called a carrier. She can pass on the altered gene, but usually does not experience signs and symptoms of the disorder. In rare cases, however, females who carry a *TRAPPC2* mutation may develop arthritis in early adulthood.

Other Names for This Condition

- Dysplasia, Spondyloepiphyseal
- Late-onset spondyloepiphyseal dysplasia
- SED tarda
- Spondyloepiphyseal Dysplasia
- X-linked SED
- X-linked SEDT

Diagnosis & Management

Genetic Testing

- Genetic Testing Registry: Spondyloepiphyseal dysplasia tarda
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0220776/

Other Diagnosis and Management Resources

- GeneReview: X-Linked Spondyloepiphyseal Dysplasia Tarda
  https://www.ncbi.nlm.nih.gov/books/NBK1145

General Information from MedlinePlus

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html

Additional Information & Resources

MedlinePlus

- Health Topic: Bone Diseases
  https://medlineplus.gov/bonediseases.html
- Health Topic: Osteoarthritis
  https://medlineplus.gov/osteoarthritis.html
- Health Topic: Scoliosis
  https://medlineplus.gov/scoliosis.html

Genetic and Rare Diseases Information Center

- Spondyloepiphyseal dysplasia tarda X-linked
  https://rarediseases.info.nih.gov/diseases/4985/spondyloepiphyseal-dysplasia-tarda-x-linked

Additional NIH Resources

- National Institute of Arthritis and Musculoskeletal and Skin Diseases: Arthritis
  https://www.niams.nih.gov/Health_Info/Osteoarthritis/

Educational Resources

- Cincinnati Children's Hospital: Coxa Vera
  https://www.cincinnatichildrens.org/health/c/coxavara
- Disease InfoSearch: Spondyloepiphyseal dysplasia tarda X-linked
  http://www.diseaseinfosearch.org/Spondyloepiphyseal+dysplasia+tarda+X-linked/6828
- MalaCards: spondyloepiphyseal dysplasia tarda
  http://www.malacards.org/card/spondyloepiphyseal_dysplasia_tarda
- Orphanet: Spondyloepiphyseal dysplasia tarda
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=93284
- Swedish Information Center for Rare Diseases
  http://www.socialstyrelsen.se/rarediseases/late-onsetspondyloepiphysealdy

Patient Support and Advocacy Resources

- International Skeletal Dysplasia Registry, UCLA
  http://ortho.ucla.edu/isdr
- National Organization for Rare Disorders (NORD)
  https://rarediseases.org/rare-diseases/spondyloepiphyseal-dysplasia-tarda/
- Resource list from the University of Kansas Medical Center
  http://www.kumc.edu/gec/support/dwarfism.html

- The Human Growth Foundation
  http://hgfound.org/
- The MAGIC Foundation
  https://www.magicfoundation.org/

GeneReviews

- X-Linked Spondyloepiphyseal Dysplasia Tarda
  https://www.ncbi.nlm.nih.gov/books/NBK1145

ClinicalTrials.gov

- ClinicalTrials.gov
  https://clinicaltrials.gov/ct2/results?cond=%22X-linked+spondyloepiphyseal+dysplasia+tarda%22+OR+%22Spondyloepiphyseal+Dysplasia%22+OR+%22Dysplasias%2C+Spondyloepiphyseal%22+OR+%22Dysplasia%2C+Spondyloepiphyseal%22

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28Osteochondrodysplasias%5BMAJR%5D%29+AND+%28%28x-linked+spondyloepiphyseal+dysplasia+tarda%5BTIAB%5D%29+OR+%28spondyloepiphyseal+dysplasia+tarda%5BTIAB%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1800+days%22%5Bdp%5D

OMIM

- SPONDYLOEPIPHYSEAL DYSPLASIA TARDA, X-LINKED
  http://omim.org/entry/313400

Sources for This Summary

- Christie PT, Curley A, Nesbit MA, Chapman C, Genet S, Harper PS, Keeling SL, Wilkie AO, Winter RM, Thakker RV. Mutational analysis in X-linked spondyloepiphyseal dysplasia tarda. J Clin Endocrinol Metab. 2001 Jul;86(7):3233-6.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/11443194
- Fiedler J, Le Merrer M, Mortier G, Heuertz S, Faivre L, Brenner RE. X-linked spondyloepiphyseal dysplasia tarda: Novel and recurrent mutations in 13 European families. Hum Mutat. 2004 Jul;24(1):103.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15221797

- Gedeon AK, Tiller GE, Le Merrer M, Heuertz S, Tranebjaerg L, Chitayat D, Robertson S, Glass IA, Savarirayan R, Cole WG, Rimoin DL, Kousseff BG, Ohashi H, Zabel B, Munnich A, Gecz J, Mulley JC. The molecular basis of X-linked spondyloepiphyseal dysplasia tarda. Am J Hum Genet. 2001 Jun;68(6):1386-97. Epub 2001 May 8.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/11349230
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1226125/
- Savarirayan R, Thompson E, Gécz J. Spondyloepiphyseal dysplasia tarda (SEDL, MIM #313400). Eur J Hum Genet. 2003 Sep;11(9):639-42.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/12939648

Reprinted from Genetics Home Reference:
https://ghr.nlm.nih.gov/condition/x-linked-spondyloepiphyseal-dysplasia-tarda

Reviewed: June 2008
Published: March 21, 2017

Lister Hill National Center for Biomedical Communications
U.S. National Library of Medicine
National Institutes of Health
Department of Health & Human Services